

Date: 10.13.17

To: Kim Groff

From: Glen Thursby, Toby Stover, Dan Arsenault, Phil Colarusso, Jeanne Voorhees

RE: USEPA Review of MA DEP's Draft Final Considerations for Refinement of Dissolved Oxygen Criteria: Mount Hope Bay and Taunton River Estuary

TECHNICAL COMMENTS AND QUESTIONS

Larval Recruitment Values

1. Page 59, Larval recruitment values. It needs to be emphasized that the utility of the larval recruitment model is proportional to the amount of continuous, or near continuous monitoring data. In addition, the table values are each separate assessment values. What I mean by this is each row is independent. For example, the larval model allows 3.0 for 2 days, OR 4.0 for 14 days—not both. This is often misunderstood.
2. Another potential issue with the larval criterion value is whether or not there will be sufficient monitoring data to take full advantage of the recruitment model. If monitoring data will be limited—either with respect to time or location, then including the larval acute data in the calculation of the CMC would be advised.

CMC and CCC Values

1. General comment: with the possible exception of riverine (in space) and winter (in time), it may be that a case can be made for merging the CMC and CCC data for fewer limits.

Seasonal DO Criteria

1. Given the occurrence of more frequent, larger storm events, it is increasingly more difficult to ascertain “normal” seasonal changes. Also, considering that the critical season for DO is generally the summer/early fall, it is unclear what the benefits are for developing seasonal DO criteria.

Multiple Habitat Types

1. Overall, we support the concept of splitting a water body into multiple habitat types. However, Mount Hope Bay is a relatively small and fairly well mixed waterbody and while aquatic life may prefer a specific habitat, it doesn't preclude them from spending time in other habitats depending on the time of year and where forage or cover may be. Also, by splitting the estuary into different habitats the amount of monitoring to verify compliance with in each zone will greatly increase over what is currently done. Finally, from a regulatory stand point if the estuary is split into different habitats then which DO criteria would need to be met since in the case of an NPDES discharge the effluent would potentially travel through each of the different habitats? So would the DO target from the most sensitive habitat be the target for permitting purposes? Based on these questions, it is recommended that the final document describe how

the criteria will be applied (because things like NPDES facility effluents will go through multiple habitats), and discuss of how monitoring will be performed to ensure standards are being met in each habitat type.

If the State is to proceed with the use of multiple habitat types, it is recommended that the most sensitive endpoint and species/life stage for each habitat type is used. Protection of the most sensitive life stage of the most sensitive species assures protection for the rest. EPA and MA DEP have used this conceptual approach for toxics in discharge permitting, so taking this approach with DO would be consistent.

Safety Factor

1. Developing standards from laboratory studies indicates what organisms are physiologically capable of in a controlled laboratory setting. There are many other factors/stressors in the environment that aquatic species will be exposed to. Therefore, it is recommended that MA DEP acknowledge, similar to Connecticut, that conditions in the environment are highly variable and that lab studies do not accurately reflect these conditions. Also, Connecticut adopted a specific value greater than what might be the minimum supported by laboratory studies to account for environmental variability. This approach to include a “safety factor” is recommended for consideration and inclusion by Massachusetts for the final document.

Additional Technical Comments

1. Page 53, section 3.1.1. (GT) The sentence containing “95 percent of the species likely to be present” is technically incorrect. Technically, the criteria values as calculated are designed to protect 95% of the tested species. To the extent that the tested species represent the range of sensitivities of the species present in the environment of concern, the 95% may be protected. This is why the Guidelines have the requirement for the 8 families, etc.
2. Virginian Province Approach (PC): The Virginian Province Approach sets a mortality rate of 5% of larvae as an acceptable level due to DO stress. In healthy robust populations, a 5% added mortality rate to the natural mortality rate of larvae is still likely sufficiently protective of the adult stocks. In Mount Hope Bay, adult fish stocks have been devastated and despite massive changes in operations by Brayton Point Station, those stocks have shown very little improvement. Thus, incurring additional levels of mortality on any fish life stages in the Mount Hope Bay system is unwise and inconsistent with past regulatory practice.
3. Stressor-Response Approach vs Virginian Province Approach (TS): MA DEP has recently begun a monitoring program for dissolved oxygen in Mount Hope Bay by purchasing two monitoring buoys. To me it would make more sense to utilize monitoring data from those buoys to develop criteria that are based on the actual water quality conditions and response variables that are reflective of the biological condition in Mount Hope Bay. Utilizing a stressor-response approach to develop criteria would account for conditions and variables that are present in the system which are not able to be accounted for when using the Virginian Province approach which is based on laboratory testing and highly controlled conditions. Mount Hope Bay is a highly

altered system that is likely to have many other variables that will affect the real-world conditions in the Bay.

WATER QUALITY STANDARDS COMMENTS AND QUESTIONS

Designated Uses and Proposed DO Changes

1. Water bodies designated as SA water bodies represent "Excellent" fish habitat. Water bodies designated as SB water bodies represent "Good" fish habitat. It is our understanding of these narrative standards that physical conditions (temperature, DO, etc.) are at levels supporting near optimal growth, survival and reproduction of native species. Anthropogenic driven variances from background that cause avoidance or any other changes in normal behavior would not be allowed in waters considered excellent or good fish habitat. Can the State please more explicitly describe what excellent and good fish habitat represent and how any proposed changes in DO standards continue to protect these designations.

Antidegradation and Antibacksliding:

1. The current water quality standards for dissolved oxygen are 6 mg/L for Class A and 5 mg/L for Class B waters. The proposed values in this document are all lower than either of those standards. How does MA DEP propose to address antidegradation? Also, for NPDES permits it is unclear how antibacksliding will be addressed, please explain.

Criteria

1. According to a recent National Marine Fisheries Service document¹, Atlantic sturgeon require at least 6 mg/L dissolved oxygen for juvenile rearing habitat. It is not clear how the calculated Criterion Minimum Concentration (CMC) value for Mount Hope Bay of 3.2 mg/L for juvenile and adult sturgeon survival and the Criterion Continuous Concentration (CCC) of 4.8 mg/L will be protective considering this document, please explain.

EDITORIAL COMMENTS:

1. Page 2, section 2.1. "part per trillion" should be "parts per thousand".
2. Page 39, "*Ruppia maritima*" needs to have "L" added to end, as with *Zostera marina*.
3. Table 13. The life stages for each species listed should be listed. If they are all juveniles and adults, then this should at least be mentioned in the figure legend.
4. Page 58, section 3.1.4, a little picky, but . . . The CMC did not range from 2.8 – 3.2. It was either 2.8 (without sturgeon data) or 3.2 (with sturgeon data).
5. Table 18. Life stages should be included.

¹ National Marine Fisheries Service, 2017. Designation of Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon.
<https://www.greateratlantic.fisheries.noaa.gov/regs/2017/August/17criticalhabitatdpssatlanticsturgeonfria.pdf>

